

## PATENT ABSTRACTS OF JAPAN

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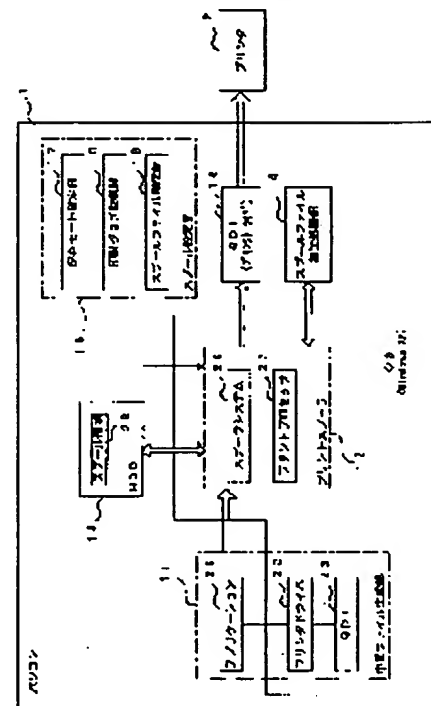
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## (54) SPOOL FILE PROCESSING DEVICE, PROGRAM, AND RECORDING MEDIUM

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To delete a processed spool file after printing without fail in a printing system which is provided with a spool file processing device.

**SOLUTION:** An intermediate file for each page created in an intermediate file creating part 11 is stored first in a spool area 28 as a spool file by a spooler system 26. In OS of a personal computer 1, the spool file in the spool area 28 is set to be deleted after printing by default, and the spool file in the spool area 28 cannot be read out in this set up. Thus, a saving mode setting part 17 changes the set up to a saving mode not to delete but to keep the spool file on startup of OS. Therefore, the spool file in the spool area 28 can be abstracted and processed at a spool file processing part 14. And, the spool file after printing process is deleted by a spool file deleting part 19.



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### **SPECIFICATION <EXCERPT>**

#### **Abstract**

[PROBLEM TO BE SOLVED] An object of the present invention is to completely delete a processed spool file after completing printing, in the printing system which has a spool file processing device.

[SOLUTION] An intermediate file for each page which is created in an intermediate file creating unit 11 is stored first in a spool area 28 as a spool file by a spooler system 26. In an OS of a personal computer 1, the spool file in the spool area 28 is set to be deleted after printing by default, and the spool file in the spool area 28 cannot be read out in this set up. Therefore, a saving mode setting unit 17 changes the set up to a saving mode not to delete but to keep the spool file on startup of the OS. Therefore, the spool file in the spool area 28 can be retrieved and processed at a spool file processing part 14. Then, the spool file after printing process is deleted by a spool file deleting unit 19.

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#### **Specification**

[0013] [Problem(s) to be Solved by the Invention] However, if the keep-document setting is turned ON in order to apply a spool file processing technique, it is normal that the printed spool file remains without being deleted. Therefore, every time a print job is processed, the number of a printed spool file is increased more and

more, so that there is a risk that a new spool file cannot be stored, or this affects other processing besides the printing performed by the computer.

[0014] In order to solve above problem, a method by which the user deletes a spool file periodically can be adopted, but since the user always needs to know the storing status and the like of the spool, and needs to perform deletion operation suitably, it become very complicated for the user. And since a spool file is generated in the printing system as one function of OS, all users cannot delete a spool file freely and the general user whose access right is limited cannot usually delete.

[0015] The present invention is address to the above problems and an object of the present invention is to completely delete the processed printed spool file, in the printing system including a spool file processing device which retrieves the spooled spool file and processes the file into a new spool file.

[0016]

[The means for solving a technical problem and an effect of the invention] In order to solve the above problem, the spool file processing device according to claim 1 stores the spool file for every print job into a storage means, outputs the spool file for every stored print job to a printing device, and sets arbitrarily whether or not the spool file of the print job outputted to the printing device is to be deleted. If the storing mode indicating that the spool file is not to be deleted but to be remained is set, the printing system, which can read the spool file stored in the storage means from the outside, processes the spool file stored in the storage means and generates a new spool file, when the printing system is set to the storing mode.

[0017] In addition, in the present invention, when processing information is included in the spool file obtained from the storage means by the spool file obtainment means, a processing means

processes the spool file based on this processing information, and returns the processed file to a storage means again as a new spool file by replaced with the spool file before processing. Then when the monitor means monitors whether or not printing operation of the print job corresponding to the processed spool file is completed, and if it is judged that printing operation is completed, a spool file deletion means deletes the spool file (being stored in the storage means) corresponding to the print job judged as that its printing operation is completed.

[0018] That is, if the printing system is set with a storing mode in order to obtain a spool file from the storage means and to process it, the new processed spool file is remained after printing operation completion though it can be processed, and as a result the problem of the above-mentioned conventional technique occurs. Therefore, the printing operation for the processed spool file is monitored, and when printing operation is completed, the spool file is deleted.

[0019] Therefore, according to the spool file processing device of the present invention, even if it is during storing mode setting, it becomes possible to delete the processed spool file certainly after printing operation completion. In addition, although the spool file deletion means may, of course, delete the spool file directly, but the method is not limited to the above. For example, the spool file deletion means may instruct the printing system to delete the spool file, and actual deletion may be performed by a predetermined function in the printing system (for example, the spooler system 43 of FIG. 4 ).

[0020] Since setting can be arbitrarily modified to be whether or not the printing system is set with storing mode, so that, for example, when, after a user unsets the storing mode setting (that is, the mode is changed to a delete mode by which a spool file is to be deleted not to be remained), another user instructs execution of special printing as described in the prior art in this mode, there is a

risk that print outputting is performed in a condition where the special printing is not performed (that is, the spool file is not processed). Moreover, as described above, like Windows the keep document setting is set to Off by default, when the printing system is set by default as that the mode is a deleting mode in setup, in order to process the spool file by special printing operation by this spool file processing device, the user needs to previously change the storing mode setting, which is quite inconvenient.

[0021] Therefore, as described in claim 3, for example, it is judged whether or not the printing system is set as storing mode, and if the storing mode is not set, a storing mode setting means sets the printing system with the storing mode. Thereby the printing system can be always to be set with the storing mode, and a spool file can be always processed. Therefore, the user can perform special printing etc., without caring about the present status of the setting.

[0022] Here, the spool file processing means of the present invention (claim 1 or 3) can be realized by various methods, for example by using separate hardware, but it is also possible when a computer executes application software (program). That is, a computer, which has programs for functioning the computer as each means in the spool file processing device and which functions as the printing system by execution of an operating system, executes the programs, in order to realize the spool file processing device of the present invention.

[0023] In this case, among the programs for operating the computer as spool file processing device of the present invention, at least the storing mode setting program for functioning as the storing mode setting means is preferably to be executed when the computer starts. That is, by executing the operating system when the computer starts, the computer starts functioning as the above-mentioned printing system, and at the same time, the storing mode setting

program is started.

[0024] Thereby, since storing mode is surely be set up with a startup of the computer, the situation, where the special printing and the like is performed in a condition that the storing mode is not set, does not occur, so that the spool file processing device of the present invention can surely performed read-out and processing of the spool file.

[0025] Further, the above-mentioned storing mode setting program is structured as a system process which is preferably performed in the privileged mode to the operating system executed by the computer . The system process (for example, the service in Windows) is executed in the privileged mode to the operating system and can set handling at the time of the computer startup (whether or not to be executed at the same time of startup). Therefore, if the storing mode setting program is constituted as a system process performed at the time of a computer startup, readout and processing of the spool file can be surely performed by the spool file processing device of the present invention.

[0026] Furthermore, among the programs for operating a computer as spool file processing device of the present invention, at least the spool file deletion program for functioning as the spool file deletion means is desirably structured to be executed in the privileged mode to the operating system which the computer executes.

[0027] That is, although the spool file deletion program is used to delete the printed spool file, but depending on a setup of authority over the operating system of this spool file deletion program, sometimes the spool file cannot be deleted. Therefore, if the spool file deletion program is executed in the privileged mode to the operating system, the spool file can be deleted certainly, without being affected by the limitation such as a file access.

[0028] Moreover, among the programs for operating a computer as spool file processing device of the present invention, the spool file

deleting program and the print job monitoring program functioning as the print job monitor means are structured as system process performed at the time of a startup of the computer, and executed only when the computer is functioning as the printing system by execution of the operating system.

[0029] With the above structure, the spool file deletion program and the print job monitoring program are executed in the privileged mode at the time of a computer startup, so that the spool file after printing operation completion can be deleted certainly. Further these two programs are executed only while the computer is functioning as the printing system, it is possible to eliminate waste that only the above-mentioned two programs are executed when the printing system is not functioning, and possible to reduce the processing loads (for example, CPU etc.) for executing the program.

[0030] Moreover, the program for operating a computer as spool file processing device of the present invention can be recorded on the record medium which computer can read, for example, a floppy (trademark) disk, a magneto-optic disk, CD-ROM, a hard disk, etc., and can be used by loading to a computer and starting if needed. In addition, the program is recorded by using ROM and backup RAM as the record medium in which computer reading is possible, and this ROM or Backup RAM may be incorporated and used for a computer.

[0031]

[Embodiment of the Invention] The following describes the preferred embodiment of the present invention with reference to the drawings. FIG. 1 is a block diagram showing the software configuration of module of the printing system of this embodiment. This embodiment shows the case where OS (operating system) of a personal computer 1 is WindowsXP. The intermediate file for printing generated in the intermediate-file generation unit 11 is once stored in the print spooler 12 as a spool file to a spool area 28. When processing information is included in the stored spool file, the



spool file is processed in the spool file processing unit 14, it returns to a spool area 28 again, a spool file is changed into a printer control code by GDI15 according to the operating state of a printer 2, and it outputs to a printer 2. In this embodiment, the spool setting unit is further added to delete the spool file stored in the spool area 28.

[0032] In addition, generally, as for a personal computer 1, OS performs controlling under hardware, such as CPU, ROM, RAM, and I/O, and application software, such as application software and a device driver, operates under the OS. And in this embodiment, it is a program module as one function of OS, and the printer driver 22 and GDI23 in the intermediate-file generation unit 11, and a print spooler 12 are the device drivers included in the personal computer 1, and the spool file processing processing unit 14, GDI15, and the spool file setting unit 16 are device drivers included in a personal computer to operate a printer 2, cooperating with OS.

[0033] Moreover, the print processor (not shown) in which OS (WindowsXP) is equipped originally is a program module which is incorporated into OS and operates by being added to a personal computer 1 corresponding to a printer 2 (install) independently, and the print processor 27 constitutes the spool file processing device of the present invention with the spool setting unit 16 and the spool file processing processing unit 14. In addition, in this embodiment, all the various programs for realizing the printing system in a personal computer 1 are stored in the hard disk (HDD) 13. Hereafter, operation of the printing system of this embodiment is explained in full detail.

[0034] As shown in FIG. 1, the print data created by the application 21 on a personal computer 1 are sent to GDI23 which is the program module which WindowsXP offers through the printer driver 22 of WindowsXP by the user, and DC (device context) which is the display field virtualized by this GDI23 is created. And the print data for every print job independent from the type of devices (a printer,

display, etc.) are stored in the coordinate designated by this DC, and drawing to the virtualized device is performed. Application 21 shows the application software of word-processing software, spreadsheet software, etc. which operates on OS.

[0035] Thus, by drawing to DC, i.e., the virtualized device, EMF (intermediate file) which is not dependent on the type of device for every page is formed. In order to combine the EMF by the spooler system 26 into one print job, the EMF is stored as a spool file in the spool area 28 which is storage means obtained by HDD 13. The processing information for performing special printing of multi-page printing, an overprint, page exchange printing, etc., are also included in this spool file.

[0036] Furthermore, the spool area 28 is not necessarily stored in the hard disk 13 in a personal computer 1. For example, a part of the storage means may be stored as the spool area 28 by equipping some storage means and the like outside the personal computer 1. The above is not limited to a specific way, as far as the area can be managed by the personal computer 1.

[0037] Moreover, the general GDI have types for DC management, for EMF forming, for DC processing change to a command depending on a device (for example, a printer and a display). The former is offered by OS and corresponds to GD 123 of FIG. 1. The latter is provided as a driver by the device manufacturer, and corresponds to GDI15 of FIG. 1.

[0038] Here, in OS (WindowsXP) of this embodiment, a keeping document setup is included by which the user sets arbitrarily whether the spool file stored in the spool area 28 to be remained stored or to be deleted after printing completion. The keeping document setup is set as OFF (that is, a delete mode for deletion after printing completion) by the default.

[0039] And in OS of this embodiment, when a keeping document setup is a default (OFF), a spool file cannot be read from the exterior.

Therefore, in order to obtain a spool file and to process it in the spool file processing unit 14 as described below, it is necessary to make a setting change of the keeping document setup at ON (that is, storing mode in which the spool file is not deleted and to be left stored). In addition, this keeping document setup can be set up for every printer which is set in the personal computer 1 (install).

[0040] Therefore, in this embodiment, the storing mode setting unit 17 in the spool setting unit 16 changes a keeping document setup to a printer 2 to ON compulsorily at the time of starting of the printing system (that is, the time of starting of OS), so that after the system startup, a spool file can be read and processed always. And the storing mode setting program for realizing the function as this storing mode setting unit 17 is constituted as a system process performed with the service program in WindowsXP, i.e., the privileged mode to OS.

[0041] In addition, the print job monitoring program for realizing the function as the print job monitoring unit 18 and the spool file deletion program for realizing the function as the spool file cutout 19 mentioned later are also constituted as a system process performed by the privileged mode to OS at the time of starting of OS. That is, each of each above-mentioned programs which realizes the spool setting unit 16 is constituted as a system process, and they is performed, without receiving limits (limit of a file access etc.) in any way in a system.

[0042] However, no print job monitoring programs and spool file deletion programs are always performed after OS starting. In the personal computer 1, the printing system as one function of OS is realized (that is, in order to process print instruction from application 21 of a printer driver 22, GDI23, a print spooler 12, etc. and output to GDI15, the printing service program with which OS is equipped originally is performed). In other words, the print job monitoring program and the spool file deletion program have

dependency with the printing service program with which OS is equipped. Therefore, when the function of a print spooler 12 is stopped, for example, the two above-mentioned programs are not performed, either.

[0043] And when performing special printing of multi-page printing, an overprint, etc., the spool file processing processing unit 14 is started, and the spool file for every print job stored in the spool area 28 by this spool file processing unit 14 is processed for special printing. More specifically, the print processor 27 obtains spool files stored in the spool area 28 and checks the spool files includes the processing information indicating what kind of special printing should be carry out to the obtained spool file. And if processing information is included, the spool file will be passed to the spool file processing unit 14.

[0044] Next, the processing in the spool file processing unit 14 is briefly described. First, the spool file passed from the print processor 27 is divided into EMF (intermediate file) for every page, and EMF of each page is copied to the temporary file formed in RAM (not shown) etc. When this temporary file becomes unnecessary, it is deleted. Note that, before page division, processing information is obtained from a spool file and it is previously determined what kind of processing is to be performed.

[0045] And each EMF for which page division is performed is processed based on processing information, for example, new EMF added with watermark alphabetic character etc. is generated. New EMF after this processing is again returned to a spool area 28 by the spooler system 26 (in page exchange printing, by replacing processing sequence, exchange of a page is performed and returned to a spool area 28). Thereby, a new print job obtained by processing original print job (spool file) stored in the spool area 28 is generated.

[0046] Then the EMF of the new print job which is processed by the

spool file processing unit 14 in this way, and is returned to the spool area 28 is sent to GDI15, and by this GDI15, EMF of a new print job is changed into the printer control code corresponding to a printer 2 by the print processor 27, and sent to a printer 2.

[0047] Note that, the command for control of a printer differs depending on manufacturers, and examples of the commands is set by various Page Description Languages (PDL;Page-Description Language), such as PCL of for example, U.S. Hewlett-Packard and PostScript (PS: trademark) of the U.S. Adobe company. Therefore, in order to cope with PDL adopted by the printer 2, by GDI15, the spool file which consists of EMF for every page is changed into the printer control code by the PDL.

[0048] On the other hand, as mentioned above, in this embodiment, since a keeping document setup is set as ON by the storing mode setting unit 17 with starting of OS, the spool file stored in the spool area 28 will remain as it is, without being deleted. Then, in this embodiment, by the spool setting unit 16, the printed spool file is deleted from a spool area 28.

[0049] More specifically, the print job monitoring unit 18 monitors whether the spool file stored in the spool area 28 is specifically first carried out actually by the printer 2. Then when it is judged that the printing operation by the printer 2 is completed at this print job monitoring unit 18, the spool file cutout 19 directs to the spooler system 26 so that the spool file of that print job that carried out printing completion may be deleted from a spool area 28 (deletion directions). The spooler system 26 which received these deletion directions will actually delete the spool file in a spool area 28.

[0050] The print job monitoring unit 18 monitors, for the spool file stored in the spool area 28, the printer control code output (printing operation activation by the printer 2). And the spool file cutout 19 deletes the spool file stored in the spool area 28 at the same time of printing operation completion. Therefore, the spool file once

stored to the spool area 28 which is stored temporarily in the spool area 28 to be printed by the printer 2 is always deleted when the printer 2 completes printing, so that the printed spool file will not remain in a spool area 28.

[0051] In the printing system of this embodiment explained in full detail above, when the print data which the user created with application 21 are to be performed with special printing, print data are processed as shown in FIG. 2. That is, if printing directions are made by user operation from application 21, it will be sent to GDI23, DC will be created by this GDI23, and those contents of directions will be supplied to application 21. Thereby, drawing processing to DC by application 21 is performed, consequently EMF (intermediate file) is generated for every page, and it is stored as a spool file by the spooler system 26 to a spool area 28.

[0052] And the print processor 27 retrieves the stored spool file, and judges whether or not processing information is included, and when contained, the spool file is sent to the spool file processing processing unit 14. In the spool file processing unit 14, the sent spool file is processed according to processing information, and the new processed spool file is again returned to a spool area 28 through the spooler system 26. Then the spool file stored in the spool area 28 is passed to GDI (printer driver)15, and by this GDI15, is changed into the printer control code corresponding to the printer 2 of an output destination change by the print processor 27, and is outputted to a printer 2.

[0053] Here, the spool setting unit 16 monitors whether printing operation of the print job corresponding to each spool file is completed about the spool file for every print job, and if the printing operation by the printer 2 is completed, the spool file of that ended print job is deleted from a spool area 28 (in detail, the command to be deleted is outputted to the spooler system 26).

[0054] Next, the spool file deletion control processing performed to

realize the function of the spool setting unit 16, in other words, a spool file deleting processing performed according to the storing mode setting program, the print job monitoring program, and the spool file deletion program is explained with reference to FIG. 3. FIG. 3 is a flow chart which shows spool file deletion control processing of this embodiment. This processing is performed as service (system process) in WindowsXP at the time of starting of a personal computer 1 (at the time of starting of the printing system) as stated above.

[0055] If this processing is started, first, the whole processing concerned is initialized at step (hereinafter, referred to as "S") 110 (variable initialization etc.), and in next S120, the printers registered into the system (install) is enumerated and shifted to S130. In S130, it is judged whether there is any printer newly enumerated by processing of S120 (in other words, whether or not processing of S140 and following processing are completed in all enumerated printers). If printers are not enumerated at all, in other words, if the printer is not installed at all or the processing of and after S140 are completed in all printers), a negative judging is carried out by S130, and the step shifts to S210, and after a break of a predetermined time (in this embodiment for 5 seconds), the step returns to S110 again.

[0056] When printers are enumerated, processing of and after S140 are performed. First, in S140, it is judged whether the print processor used in case the enumerated printer performs printing processing, in other words, whether the processor can be perform special printing. If it does not perform the processing, the step returns to S120 and printers are again enumerated, if a new printer is enumerated besides the printer by which enumeration and processing (of and after S140) are enumerated, processing after S140 are again performed about the printer.

[0057] On the other hand, if the print processor of the enumerated

printer performs the processing (YES at S140), the step shifts to S150, and it is judged whether a keeping document setup to the printer is turned on. Here, since Windows is usually off setup by the default, a negative judging is carried out, and the step proceeds to S160 and the keeping document setup is changed to ON.

[0058] Then the print jobs in the printer are enumerated in S170, and it is judged by S180 whether there is any print job newly enumerated by processing of S170 (in other words, whether or not processing of S190 and following processing are completed in all enumerated printers). If print jobs are not enumerated at all at this time, a negative judging is be carried out by S180, and the step returns to S120 again, but if print jobs are enumerated, processing of and after S190 are performed.

[0059] First, in S190, it is judged whether printing (printing operation by the printer 2) of the enumerated print job is completed and if it has not ended, the step returns to S170, but if it has ended, the step shifts to S200, and the spool file of the print job is deleted from a spool area 28, and the step returns to S170 again. That is, in this spool file deletion control processing, processing of and after S140 are performed to printer each which is enumerated, and further, if the print processor performs the processing, while enumerating the print jobs in the printer, processing of and after S190 are performed for each of the enumerated print jobs.

[0060] Therefore, like the printing system shown in FIG. 1, when the printer 2 which can perform special printing is installed in the personal computer 1, at least this printer 2 is enumerated by printer listing processing of S120. In that case, of course, if the print processor (print processor 27 of FIG. 1 ) of the printer 2 can perform the processing, in other words, the spool file does not include processing information, the spool file is passed to the spool file processing unit 14, so that in S140 an affirmation judging is carried out and the step proceeds to steps of and after S150.



[0061] thereby, in the printer 2, a keeping document setup is ON and a spool file can be read out and processed, and all spool files of the print job which the printer 2 have printed are certainly deleted by processing of S200.

[0062] Therefore, according to the printing system of this embodiment, even if a keeping document setup of OS is off by the default, by the storing mode setting unit 17, the keeping document setup is changed into ON with OS starting, so that the spool file stored in the spool area 28 can be obtained, and spool file processing in the spool file processing unit 14 can be performed certainly.

[0063] Moreover, although by turning ON a keeping document setup in this way, a spool file usually remains in a spool area 28 without being deleted, but in this embodiment, the print job monitoring unit 18 monitors whether the printing of a printer 2 is completed, and when it is completed, the spool file cutout 19 deletes the spool file of the printed print job from a spool area 28. Therefore, even if a keeping document setup is ON, the printed spool file can be deleted certainly.

[0064] Furthermore, each program for operating a personal computer 1 as each part 17-19 of the spool setting unit 16 can realize as functions of services for WindowsXP (system process performed by the privileged mode to OS), so that any limitation is imposed on the setting modification of a keeping document, access to a spool file, etc., thereby realizing these functions surely.

[0065] Furthermore, among the above-mentioned programs, the print job monitoring program and a spool file deletion program have dependency with printing service program which OS has, so that when the printing service program is not performed (that is, while the printing system as one function of OS is not functioning), it is possible to eliminate waists that only the print job monitoring program and the spool file deletion program are executed, thereby

reducing the processing load of CPU (not shown) etc.

[0066] Here, correspondence relationships between the component of this embodiment and the component of the present invention is clarified. In this embodiment, the print processor 27 is equivalent to the spool file obtainment means of the present invention, the spool file processing processing unit 14 is equivalent to the processing means of the present invention, the print job monitoring unit 18 is equivalent to the print job monitor means of the present invention, and the storing mode setting unit 17 is equivalent to the storing mode setting means of the present invention. Moreover, in this embodiment, the spool file cutout 19 only instructs the spooler system 26 to delete a spool file, and actual deleting processing is performed by the spooler system 26. Therefore, the spooler system 26 and the spool file cutout 19 form the spool file deletion means of the present invention.

[0067] However, the present invention is not limited to the above structure, and the spool file cutout 19 may function as the spool file deletion means of the present invention independently (in other words, the spool file cutout 19 deletes directly the spool file in the direct spool field 28 without the spooler system 26).

[0068] Moreover, in spool file deletion control processing of FIG. 3, processing of S190 is equivalent to the processing which the print job monitor means of the present invention performs, processing of S200 is equivalent to the processing which the spool file deletion means of the present invention performs, and processing of S150-S160 is equivalent to the processing which the storing mode setting means of the present invention performs.

[0069] Note that in the above embodiment, the various programs for serving as functions of spool file processing device of the present invention (more specifically, program for realizing the function as the spool setting unit 16, the spool file processing unit 14, and print processor 27) and program for realizing the function as GDI15 have

been explained being stored in HDD13. However, these various programs may be also recordable on the record medium which can computer read a floppy disk, a magneto-optic disk, CD-ROM, a hard disk, etc.

[0070] In this case, in the computer system, the spool file processing apparatus of the present invention can be realizable, by loading the program recorded on the record medium to a computer system and starting it, as needed. Note that it is also possible that a ROM or a backup RAM is stored as a computer-readable recording medium into each above-mentioned program, and this ROM or Backup RAM is incorporated into the computer system, to be used.

FIG. 1

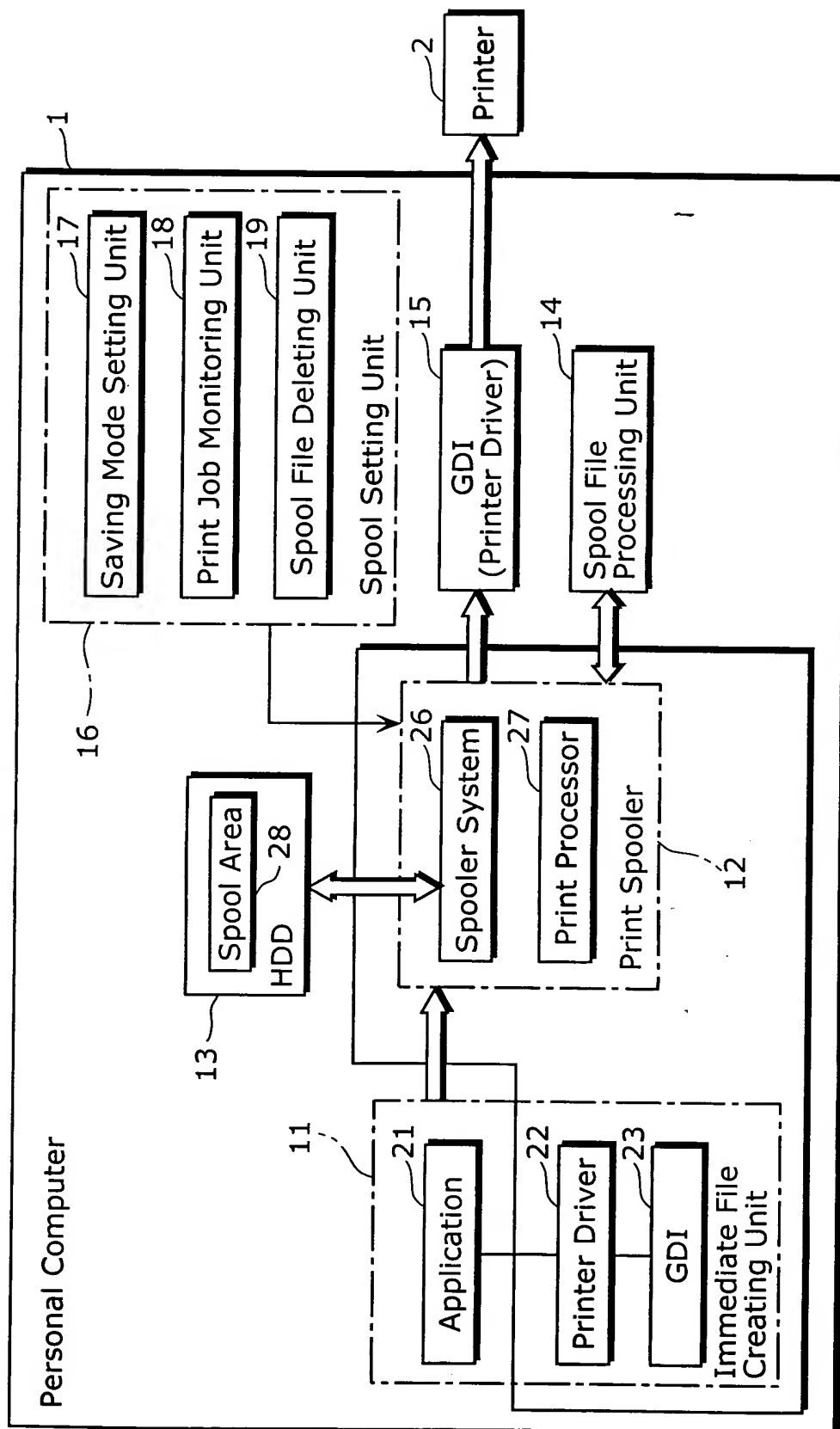
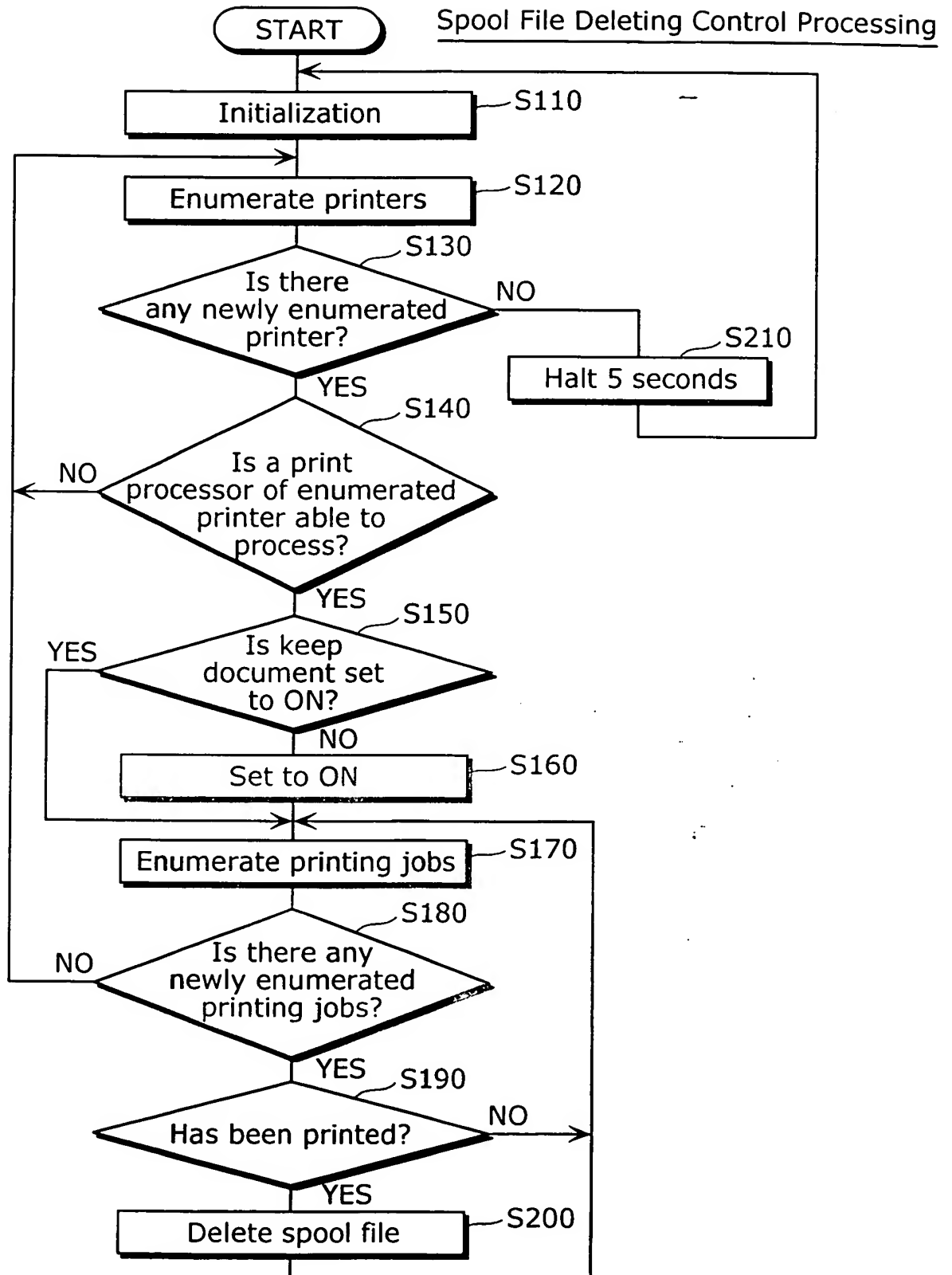


FIG. 3



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